CLAIMS:

1. A magnetic resonance imaging (MRI) system (1) comprising:
- an object space (2) for receiving an object (3) to be examined;
- a main magnet system for generating a main magnetic field in the object space;
- a gradient magnet system for generating gradients of the main magnetic field in the object space;
- a plurality of transmit coils (11, 12) located adjacent the object space (2);
- a coil drive circuit (100) for generating a plurality of individual coil drive signals (S_{D1}, S_{D2}),

characterized in that the individual coil drive signals (S_{D1}, S_{D2}) are generated by the coil drive circuit (100) so as to have a substantially identical shape, the system (1) having controllable means (110, 120) for individually setting the amplitude and/or phase of each of said coil drive signals S_{D1}, S_{D2}), and a controller (103) for controlling said controllable means (110, 120).

2. An MRI system (1) as claimed in claim 1, characterized in that said controller (103) has a user input (105) for receiving a user input signal defining or selecting a volume of interest (5) within said object space (2).

3. An MRI system (1) as claimed in claim 1, characterized in that said coil drive circuit (100) comprises a signal generator (101) for generating a basic signal (S_B) and a plurality of coil drive branches (110, 120) for driving a respective one of the plurality of coils (11, 12), said drive branches being coupled to receive input signals derived from or identical to said basic signal (S_B).

4. An MRI system as claimed in claim 3, characterized in that each coil drive branch (110, 120) has its input coupled to one output of said signal generator (101).

5. An MRI system (1) as claimed in claim 3, characterized in that said coil drive circuit (100) also comprises a basic amplifier (102) having an input connected to an output of said signal generator (101), each coil drive branch (110, 120) having its input coupled to one output of said basic amplifier (102).

6. An MRI system (1) as claimed in claim 3, characterized in that each coil drive branch (110, 120) comprises a controllable amplifier (111, 121).

7. An MRI system (1) as claimed in claim 3, characterized in that each coil drive branch (110, 120) comprises a controllable phase shifter (112, 122).

8. An MRI system (1) as claimed in claim 6 or 7, characterized in that said controller (103) is coupled to control said controllable amplifier (111, 112) and/or said controllable phase shifter (112, 122).

9. An MRI system (1) as claimed in claim 8, characterized in that the system also comprises a memory (104), associated with said controller (103), for storing information on the field characteristics of each coil (11, 12) and for storing information on field distortions caused by an object (3) in the object space (2).

10. An MRI system as claimed in claim 9, characterized in that said controller (103) is designed to:

- receive input information at an input (105), said input information relating to a type of object (3) in the object space (2) and a selection of an object part (4);
- read from said memory (104) individual field characteristics (21, 22) of the individual transmit coils (11, 12) as well as field distortion characteristics of the object (3) in the object space (2);
- control the settings of said controllable amplifier (111, 121) and/or the settings of said controllable phase shifter (112, 122), taking into account said information received at said input (105) as well as said information read from said memory (104), in such a way that, an overall magnetic field of improved homogeneity, is obtained in a predetermined volume of interest (5) corresponding to said object part (4).

11. An MRI system (1) as claimed in claim 10, characterized in that said controller (103) is designed to control the settings of said controllable amplifier (111, 121) and/or the settings of said controllable phase shifter (112, 122) in such a way that an overall magnetic field has a locally substantially constant magnitude at a location within said volume of interest (5), preferably at the center of said volume of interest (5).